UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,794	05/04/2001	Adrian Boariu	042933/302745	7888

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ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER
ZHENG PUENTE, EVA YI

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

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	Application No.	Applicant(s)
Office Action Summary	09/848,794	BOARIU, ADRIAN
	Examiner	Art Unit	
	Eva Y. Puente	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 October 2007</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 11-15* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 11-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, see Amendment, filed 10/30/07, with respect to the rejection(s) of claim(s) 1-5 and 11-15 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

    Applicant's argument – Prior art Hammons, JR. et al failed to teach decoding based upon a real-valued vector.

    Examiner's response – Applicant is reminded that the Examiner is entitled to give the broadest reasonable interpretation to the language of claims. The current claim does not exclude detection based upon complex vector. In other words, claim does not specify detecting based upon real-valued vector only. Therefore, Hammons's teaching of both real and complex vector meet the claim limitation. However, with further review and consideration, Examiner decides to make new rejections to meet the claimed limitation.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1-5 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hammons, JR. et al (Pub. No.: US 2004/0146014).

a)   Regarding to claim 1, Hammons disclose apparatus for a communication system

in which space-time encoded data (58 in Fig. 2) is transmitted at a first location (70a in

Fig. 2) and at least at a second location (70b in Fig. 2) for communication to a receive

station (72 in Fig. 2), said receive station for decoding the space-time encoded data

received thereat, said an apparatus comprising:

        a decoder (80 in Fig. 2) coupled to receive indications of received values of the

space-time encoded data received at the receive station, said decoder for directly

combining values of the space-time encoded data transmitted from different ones of the

first and at least second locations to the receive station (a single antenna at receiver in

Fig. 2), the received values of the space-time encoded data, once directly combined,

forming a real-valued vector, free of imaginary component parts (Equations 1 and 2

inherently comprises real-value vector, which is inherently free of imaginary component

parts). Hammons does not specify the decoder for detecting values of symbols of which

the space-time encoded data is formed, based upon the real-valued vector only.

        However, Hammons disclose both space-time BPSK and QPSK codes. BPSK

has constellation real values of +1 and -1. It has two phases which are 180 degrees

apart. Thus, BPSK does not have complex values. Therefore, it is obvious to one of

ordinary skill in art to recognize the detecting values of symbols based upon the real-

valued vector only when the received symbols are BPSK symbols.

b)   Regarding to claim 11, Hammons disclose a method for communicating in a

communication system in which space-time encoded data (58 in Fig. 2) is transmitted at

a first location (70a in Fig. 2) and at least a second location (70b in Fig. 2) for

communication to a receive station (72 in Fig. 2), said method for decoding the space-

time encoded data, once received at the receive station, said method comprising the

operations of:

directly combining received values of the space-time encoded data transmitted

from different ones of the first and at least second location to the receive station (a

single antenna at receiver in Fig. 2), the received values of the space-time encoded

data, once directly combined, forming a real-valued vector, free of imaginary component

parts (Equations 1 and 2 inherently comprises real-value vector, which is inherently free

of imaginary component parts) [0012-0015]). Hammons does not specify the decoder

for detecting values of symbols of which the space-time encoded data is formed, based

upon the real-valued vector only.

However, Hammons disclose both space-time BPSK and QPSK codes. BPSK

has constellation real values of +1 and -1. It has two phases which are 180 degrees

apart. Thus, BPSK does not have complex values. Therefore, it is obvious to one of

ordinary skill in art to recognize the detecting values of symbols based upon the real-

valued vector only when the received symbols are BPSK symbols.

c)   Regarding to claim 2, Hammons disclose the apparatus of claim 1, wherein the

space-time encoded data transmitted at the first and at least second locations

comprises a space-time encoded block of data (as shown in Fig. 4), and wherein said

decoder directly combines received values of the space-time encoded block (as shown in Fig. 2).

d)   Regarding to claim 3, Hammons disclose the apparatus of claim 2 wherein said decoder further forms a sequence estimate, the sequence estimate formed of a sequence of values of the symbols ([0005-0022]).

e)   Regarding to claims 4 and 14, Hammons disclose wherein the communication system comprises a radio communication system (inherent as DS-CDMA; [0041]), wherein the first location at which the space-time encoded data is transmitted comprises a first antenna transducer (70a in Fig. 2), wherein the second location at which the space-time encoded data is transmitted comprises a second antenna transducer (70b in Fig. 2), the second antenna transducer spaced apart from the first antenna transducer (as shown in Fig. 2), wherein the receive station comprises a radio receiver (72 in Fig. 2), and wherein said decoder is coupled to receive indications of the space-time encoded data received at the radio receiver (80 in Fig. 2).

f)   Regarding to claims 5 and 15, Hammons disclose wherein the space-time encoded data transmitted at the first antenna transducer is transmitted upon a first communication path to the receive station (Ant1 in Fig. 2), wherein the space-time encoded data transmitted at the second antenna transducer is transmitted upon a second communication path to the receive station (Ant2 in Fig. 2), wherein the receive station comprises at least one receive-antenna transducer (72 in Fig. 2) coupled to transducer indications of the space-time encoded data transmitted upon the first and second communication paths, respectively, into electrical form, and wherein the

indications of the received values of the space-time encoded data to which said decoder

is coupled to receive are in electrical form, subsequent to reception at the receive

antenna transducer (as shown in Fig. 2).

g)   Regarding to claim 12, Hammons disclose the method of claim 11 wherein the

space-time encoded data transmitted at the first and at least second locations

comprises a space-time encoded block of data (as shown in Fig. 4) and wherein said

operation of directly combining received values of the space-time encoded data

comprises directly combining values of the space-time encoded block (a single antenna

at receiver in Fig. 2).

h)   Regarding to claim 13, Hammons disclose the method of claim 12 further

comprising the an operation of forming a sequence estimate, the sequence estimate

formed of a sequence of values of the symbols detected during said operation of

detecting values of symbols of which the space-time encoded data is formed (Fig. 2 and

4; [0005-0022]).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Eva Y Puente whose telephone number is 571-272-

3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

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Eva Yi Puente
Examiner ·
Art Unit 2611

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January 18, 2008

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER